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10/648,657

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Yoshihide Hoshino

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EXAMINER

SHAH, MANISH S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,657

Applicant(s)

HOSHINO, YOSHIHIDE

Examiner

Manish S. Shah

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-16 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7-13,15,16,18-20 and 23 is/are rejected.
- 7) ☒ Claim(s) 5,6 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 1 & 19 are objected, as failing to comply with the written description requirement. The claim 1 contains subject matter "before the jetted ink received on the recording medium", and claim 19 contains "the active energy ray is radiated in 0.001-2.0 seconds after the jetted ink received on the recording medium.", which is not clear. Both the claims are totally opposite to each other. Appropriate correction required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 4 & 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsumoto et al. (# US 6523948).

Matsumoto et al. discloses an ink jet recording apparatus (figure: 1, element: 9), for forming an image on a recording medium including a carrying section (rollers) for carrying the recording medium (elements: 20, 24, 21, 21 a, 42 – 44); a line head for

Art Unit: 2853

jetting ink to the recording medium (figure: 1, element: 23), the head line being provided in a direction approximately perpendicular to a carrying direction of the recording medium which is carried by the carrying section (figure: 3; column: 5, lines: 43 – 46), and an active energy ray radiation section for radiating an active energy ray to the ink jetted on the recording medium, to cure the ink (figure: 19, element: 153) UV (ultraviolet) source. They also disclose a temperature controlling mechanism for controlling the temperature of the recording medium, which is carried by the carrying section within a preset target temperature range, before the jetted ink is received on the recording medium (figure: 16D, element: 138, [0103], [0106]). They also disclose that the temperature controlling mechanism controls a temperature of the recording medium which is carried by the carrying section within the preset target temperature range at least at one of an image forming position facing to the line head where an image is formed on the recording medium by receiving the jetted ink on the recording medium carried by the carrying section, and a position which is upstream position of the image forming position in a carrying direction, and that the radiation of the active energy ray is divided into a plurality of steps (figure: 1, element: 26) (thermal head) is upstream of the printhead (element: 23, figure: 1; Column 14, lines 35 – 57).

3. Claim 23 is rejected under 35 U.S.C. 102(e) as being anticipated by Ushirogouchi et al. (# US 2003/023123 A1).

Ushirogouchi et al. discloses an ink jet recording apparatus (figure: 1-11, [0026]), for forming an image on a recording medium including a carrying section for carrying the

Art Unit: 2853

recording medium (elements: 3, figure: 1); a line head for jetting ink to the recording medium ([0184]; figure: 1, element: 4), the head line being provided in a direction approximately perpendicular to a carrying direction of the recording medium which is carried by the carrying section (figure: 1-11), and an ultraviolet radiation section for radiating an active energy ray to the ink jetted on the recording medium, to cure the ink (figure: 1-11, element: 5) UV (ultraviolet) source. They also disclose a temperature controlling mechanism for controlling the temperature of the recording medium, which is carried by the carrying section within a preset target temperature range, (figure: 1-11) (UV control unit). They also disclose that the temperature controlling mechanism controls a temperature of the recording medium which is carried by the carrying section within the preset target temperature range at least at one of an image forming position facing to the line head where an image is formed on the recording medium by receiving the jetted ink on the recording medium carried by the carrying section, and a position which is upstream position of the image forming position in a carrying direction, and that the radiation of the active energy ray is divided into a plurality of steps is upstream of the printhead (figure: 1-11). They also disclose that the temperature controlling mechanism includes a temperature detecting section and temperature adjusting section, wherein temperature adjusting section includes a heat plate (element: 16, figure: 8) or includes an air blowing apparatus, which directs heated air to the recording medium (element: 8, figure: 1-2, 9). They also disclose that the temperature adjusting section arranged in the opposite side of the line head across the recording medium, which is carried by the carrying section (figure: 1-11). They also disclose that the energy ray is

radiated right after the jetted ink is received on the recording medium, which is same as from 0.001 to 2.0 seconds ([0189]-[0190]). They also disclose that the preset temperature is changed according to the type of the recording medium ([0186]-[0193]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 7 & 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6523948) in view of Tomotake et al. (# US 6746115).

Matsumoto et al. fail to teach the claimed invention of an ink jet recording apparatus (1) wherein the ink has cationic polymerization characteristics; (2) the temperature controlling mechanism includes a temperature detecting section for detecting temperature of the recording medium; a temperature adjusting section for carrying out at least one of heating and cooling of the recording medium which is carried by the carrying section; and a control section for controlling the temperature adjusting section by comparing a temperature detected by the temperature detecting section with a preset temperature. (3) The temperature adjusting section comprises a heat roller, which is rotatably supported around a shaft and emits heat, and the periphery of the

Art Unit: 2853

heat roller is in contact with the recording medium along at least 90 degrees of center angle.

Tomotake et al. teaches the use of cationic resin for use in ink for ink jet printers (column: 6, line: 28 – 40). They also teaches that the temperature controlling mechanism includes a temperature detecting section for detecting temperature of the recording medium (figure: 1, element: 5); a temperature adjusting section for carrying out at least one of heating and cooling of the recording medium which is carried by the carrying section; and a control section for controlling the temperature adjusting section by comparing a temperature detected by the temperature detecting section with a preset temperature (column: 17, line: 25 – 42). They also teach that the temperature adjusting section includes a heat roller, which is rotatably supported around a shaft and emits heat, and the periphery of the heat roller is in contact with the recording medium along at least 90 degrees of center angle (column: 17, line: 43 - 50, Figure 1, element 43 (heater), 44 (roller)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the ink having cationic characteristics, the heated roller, and media temperature control of Tomotake et al. in the ink jet printer apparatus of Matsumoto et al. in order to obtain faster better ink drying properties with the use of an ultraviolet source.

5. Claims 11, 13 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6523948) in view of Tomotake et al. (# US 6746115) as

Art Unit: 2853

applied to claims 3, 7 & 12 above, and further in view of Yraceburu et al. (# US 6460990).

The combination of Matsumoto et al. and Tomotake et al. teach all of the limitations of the claimed invention except that (1) the temperature adjusting section is in contact with a back surface of a platen with which the recording medium is in contact, the platen keeping the recording medium flat on the printing region; (2) the temperature adjusting section comprises a heat plate which emits heat, and the heat plate is in contact with the recording medium by a component of a force which is generated when carrying the recording medium; (3) the temperature adjusting region is arranged on the opposite side of the line head across the recording medium which is carried by the carrying section.

Yraceburu et al. disclose the temperature adjusting section is in contact with a back surface of a platen with which the recording medium is in contact (figure: 2, element: 26 (platen), element: 30 (heater); the platen keeping the recording medium flat on the printing region; and that the temperature adjusting section comprises a heat plate which emits heat (figure: 2, element: 70) is disposed on a plate, clearly seen, and the heat plate is in contact with the recording medium by a component of a force which is generated when carrying the recording medium, (figure: 1B, element: 50) (vacuum source). With this arrangement, the temperature-adjusting region is arranged on the opposite side of the line head across the recording medium, which is carried by the carrying section.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the heated and vacuum media hold-down platen of Yraceburu et al. in the combined invention of Matsumoto et al. and Tomotake et al. in order to permit controlled drying characteristics of ink placed on the media and to increase printing output.

6. Claims 8 & 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6523948) in view of Tomotake et al. (# US 6746115) as applied to claims 3, 7 & 12 above, and further in view of Tasaki et al. (# EP 0307251 A2).

The combination of Matsumoto et al. and Tomotake et al. fail to teach the claimed invention that the apparatus further comprises a humidity detecting section for detecting humidity around the recording medium, and the preset temperature is changed according to the detected humidity, and that the preset temperature rises corresponding to an increase of the detected humidity.

Tasaki et al. disclose a humidity detecting section for detecting humidity around the recording medium (figure: 1, element: 17), and the preset temperature is changed according to the detected humidity, and that the preset temperature rises corresponding to an increase of the detected humidity (page: 13, claims: 1 – 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the humidity detector of Tasaki et al. in the combined invention of Matsumoto et al. and Tomotake et al. in order to maintain proper ink drying characteristics in varying ambient humidity conditions.

7. Claims 10 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6523948) in view of Tomotake et al. (# US 6746115) as applied to claims 3, 7 & 12 above, and further in view of Medin et al. (# US 5287123).

Matsumoto et al. fail to teach the claimed invention of an ink jet recording apparatus wherein the preset temperature is changed according to the type of the recording medium; and that the temperature adjusting section comprises an air blowing apparatus which directs heated air to the recording medium carried by the carrying section.

Medin et al. disclose an ink jet recording apparatus wherein the preset temperature is changed according to the type of the recording (figure: 5A, steps 312 through 314); and a temperature adjusting section comprises an air blowing apparatus which directs heated air to the recording medium carried by the carrying section (see Abstract, lines 9 - 17, element 90 (fan)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the preset temperature in view of Medin et al. in the temperature adjusting section of Matsumoto et al. and Tomotake et al. and use the blowing apparatus which directs heated air to the recording medium in of Medin et al. in the printing apparatus of Matsumoto et al. and Tomotake et al. in order to set the correct temperature of the media for the media type and obtain best ink drying properties of the media used.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6523948) in view of Chang (U.S. 6,619,777 B2).

Matsumoto et al. fail to teach the claimed invention of an ink jet recording apparatus wherein the amount of a droplet of the ink, which is jetted from the line head to the recording medium, is 2-15 pl (picoliter).

Chang discloses an ink jet recording apparatus (figure: 1, element: 1 (printhead with piezoelectric actuators)), wherein the amount of a droplet of the ink, which is jetted from the line head to the recording medium, is 4 - 20 pl (picoliter) (column: 8, lines: 66 - 67, column: 9, lines: 1 - 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the piezoelectric printhead of Chang in the printing apparatus of Matsumoto et al. in order to achieve high printing resolution.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (# US 6523948) in view of Ushirogouchi et al. (# US 2003/023123 A1).

Matsumoto et al. fail to teach the claimed invention of an ink jet recording apparatus, wherein the active energy ray is radiated in 0.001-2.0 seconds after the jetted ink is received on the recording medium.

Ushirogouchi et al. teaches that to get the high quality printed image, the active energy ray is radiated in 0.001-2.0 seconds after the jetted ink is received on the recording medium ([0189]-[0190]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the inkjet recording apparatus of Matsumoto et al. by the

aforementioned teaching of Ushirogouchi et al. in order to have a high quality printed image.

Allowable Subject Matter

10. Claims 21-22 are allowed.

11. Claims 5, 6 & 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(1). A search of prior art did not cite an ink jet recording apparatus wherein a heat quantity loss is not more than 15% of a heat quantity which is applied to the recording medium, when the recording medium is carried to the image forming position after received certain heat quantity which is determined by adjusting temperature of the recording medium, in a case of the temperature controlling mechanism being provided only at the upstream position in the carrying direction as claimed in the limitations of claim 5.

(2). A search of prior art did not cite an ink jet recording apparatus wherein the upstream position of the image forming position in the carrying direction is from a start point of a printing region to a position which is double widths of the printing region away from the start point as claimed in the limitations of claim 6.

(3). A search of prior art did not cite an ink jet recording apparatus wherein the temperature adjusting section comprises a peltier element which is used with a heat

transfer member for transferring heat to the recording medium, and the heat transfer member is in contact with the recording medium by a component of a force which is generated when carrying the recording medium as claimed in the limitations of claim 14.

Response to Arguments

12. Applicant's arguments filed 04/18/2005 have been fully considered but they are not persuasive. Applicant argued that the Matsumoto et al. didn't disclose or suggest a temperature controlling mechanism for controlling the temperature of recording medium which is carried by the carrying section within a preset target temperature range, which is not persuasive. Matsumoto discloses the UV intensity adjuster, and if you increase the intensity of the UV light that means you can get more heat and if you lower the intensity, then it give the lower temperature, so basically Matsumoto teaches the temperature controlling unit. They also teaches that the "IRLDs 138 preheat recording material 137 before the printing" and "the ink droplet 140 is ejected by each of nozzle 139 to a printing position in a preheating pattern, and dried quickly because of the heat" ([0103], [0106]), which is the same as temperature controlling mechanism controlling the temperature before the jetted ink is received on the recording medium (figure: 16D; [0103], [0106]). In [0106], they clearly suggest that the ultraviolet emitting laser unit is disposed instead of IRLDs (infrared laser diodes).


13. The Ushirogouchi et al. reference is still reads on the claim 23 limitation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manish S. Shah whose telephone number is (571) 272-2152. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Manish S. Shah
Primary Examiner
Art Unit 2853

MSS

1/6/06